CLAIMS

We Claim:

1. A process for polymerizing olefin(s) in a reactor in the presence of a bulky ligand transition metal metallocene~~-type~~ catalyst system, said process comprising the step of removing all or a portion of non-polymerizable internal olefins.

2. The process in accordance with claim 1 wherein the process is a gas phase process.

3. The process in accordance with claim 1 wherein the process is a slurry process.

4. The process in accordance with claim 1 wherein the internal olefins comprise at least one internal, di- and tri- substituted olefin.

5. The process in accordance with claim 4 wherein the internal olefins are internal, di- or tri- substituted olefins having an electronegativity value less than +0.093 Hartrees.

6. The process in accordance with claim 1 wherein one or more of the internal olefins are selected from the group consisting of cis-3-methyl-pentene-2, trans-3-methyl-pentene-2, cis-hexene-2, trans-hexene-2, 2-methyl-pentene-2, cis-3-methyl-heptene-2, trans-3-methyl-heptene-2, cis-3-methyl-heptene-3, trans-3-methyl-heptene-3, trans-4-methyl-pentene-2, 2-methyl-heptene-2, cis-butene-2, trans-butene-2, 2-methyl-butene-2, 2,3-dimethyl-butene-2, cis-2-methyl-heptene-3, trans-2-methyl-heptene-3, cis-3-methyl-hexene-2, trans-3-methyl-hexene-2, cis-3-methyl-hexene-3, trans-3-methyl-hexene-3, 2-methyl-hexene-2, cis-3-methyl-octene-2, trans-3-methyl-octene-2, cis-3-methyl-octene-3, trans-3-methyl-octene-3, 2-methyl-octene-2, cis-2-methyl-octene-3, trans-2-methyl-octene-3, cis-

octene-2, trans-octene-2, cis-3-methyl-nonene-2, trans-3-methyl-nonene-2, cis-3-methyl-nonene-3, trans-3-methyl-nonene-3, 2-methyl-nonene-2, cis-decene-2 and trans-decene-2.

7. The process in accordance with claim 4 wherein the at least one olefin is hexene-1 and the internal olefins are selected from one or more of the group consisting of cis-3-methyl-pentene-2, trans-3-methyl-pentene-2, cis-hexene–2, trans-hexene-2 and 2-methyl-pentene-2.

8. The process in accordance with claim 4 wherein the at least one olefin is octene-1 and the internal olefins are selected from one or more of the group consisting of cis-3-methyl-heptene-2, trans-3-methyl-heptene-2, cis-3-methyl-heptene-3, trans- 3-methyl-heptene-3, cis-octene-2 and trans-octene-2.

9. The process in accordance with claim 4 wherein the at least one olefin is 4-methyl-pentene-1 and the internal olefins are 2-methyl-pentene-2, trans-4-methyl-pentene-2.

10. The process in accordance with claim 4 wherein the at least one olefin is butene-1 and the internal olefins are selected from one or more of the group consisting of cis-butene-2 and trans-butene-2.

11. The process in accordance with claim 1 wherein all the internal olefins are removed from the process.

12. The process in accordance with claim 1 wherein the process is operating for more than 12 hours from start-up of the process.

13. The process in accordance with claim 1 wherein the process is continuously operating for more than 36 hours from start-up of the process.

14. The process in accordance with claim 1 wherein the process is producing a polymer product having a particle bulk density greater than 0.3500 g/cc.

15. A continuous process for polymerizing ethylene and at least one comonomer having from 4 to 20 carbon atoms in the presence of a bulky ligand transition metallocene~~-type~~ catalyst system in a reactor, the process comprising the step of: removing all or a portion of internal olefins and maintaining a level of the internal olefins in the process to less than 5 weight percent based on the total weight percent of the comonomer and internal olefins in the reactor.

16. The process in accordance with claim 15 wherein the internal olefins are structural and positional isomers of the comonomer.

17. The process in accordance with claim 16 wherein the level of isomers of the comonomer is maintained at less than 0.2 weight percent based on the total weight percent of comonomer and its positional and structural isomers in the reactor.

18. The process in accordance with claim 15 wherein a majority of the internal olefins have an electronegativity value less than +0.093 Hartrees.

19. The process in accordance with claim 15 wherein the internal olefins comprise at least one internal, di- or tri- substituted olefin excluding cis- and trans- hexene-3 and cis-octene-3.

20. A continuous gas process for polymerizing olefins in a reactor, said process comprising the steps of:

a) introducing a recycle stream into the reactor, the recycle stream comprising ethylene and an alpha-olefin comonomer having 4 or more carbon atoms and;

b) introducing a bulky ligand transition metal metallocene ~~type~~ catalyst system into the reactor;

c) withdrawing the recycle stream from the reactor;

d) cooling the recycle stream;

e) introducing into said recycle stream additional monomer and additional comonomer to replace the monomer and comonomer polymerized;

f) removing all or part of the isomers from the recycle stream such that the recycle stream comprises less than 5 weight percent isomers of the comonomer based on the total weight of the comonomer and its positional and structural isomers in the recycle stream;

g) reintroducing the recycle stream into the reactor; and

h) withdrawing a polymer product from the reactor.

21. The process in accordance with claim 20 wherein in the process step (g) the level of the isomers having an electronegativity value less than +0.093 Hartrees is maintained at less than 3 weight percent based on the total weight percent of the comonomer and its positional and structural isomers in the recycle steam.

22. The process in accordance with claim 20 wherein the level of the isomers is maintained at less than 0.2 weight percent based on the total weight of the comonomer and its positional and structural isomers in the recycle stream.

23. The process in accordance with claim 20 wherein the isomers are internal, di- and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3.

24. The process in accordance with claim 20 wherein the at least one comonomer is butene-1 and the isomers are selected from one or more of the group consisting of cis-butene-2 and trans-butene-2.

25. The process in accordance with claim 20 wherein one or more of the isomers are selected from the group consisting of cis-3-methyl-pentene-2, trans-3-methyl-pentene-2, cis-hexene-2, trans-hexene-2, 2-methyl-pentene-2, cis-3-methyl-heptene-2, trans-3-methyl-heptene-2, cis-3-methyl-heptene-3, trans-3-methyl-heptene-3, trans-4-methyl-pentene-2, 2-methyl-heptene-2, cis-butene-2, trans-butene-2, 2-methyl-butene-2, 2,3-dimethyl-butene-2, cis-2-methyl-heptene-3, trans-2-methyl-heptene-3, cis-3-methyl-hexene-2, trans-3-methyl-hexene-2, cis-3-methyl-hexene-3, trans-3-methyl-hexene-3, 2-methyl-hexene-2, cis-3-methyl-octene-2, trans-3-methyl-octene-2, cis-3-methyl-octene-3, trans-3-methyl-octene-3, 2-methyl-octene-2, cis-2-methyl-octene-3, trans-2-methyl-octene-3, cis-octene-2, trans-octene-2, cis-3-methyl-nonene-2, trans-3-methyl-nonene-2, cis-3-methyl-nonene-3, trans-3-methyl-nonene-3, 2-methyl-nonene-2, cis-decene-2 and trans-decene-2.

26. The process in accordance with claim 20 wherein the alpha-olefin comonomer is selected from one or more of the group consisting of butene-1, 4-methyl-pentene-1, hexene-1, octene-1 and decene-1.

27. The process in accordance with claim 20 wherein the additional comonomer introduced into the reactor is at least 98 weight percent pure comonomer.

28. The process in accordance with claim 20 wherein the polymer product is produced at a rate greater than 1000 lbs/hr (455Kg/hr).

29. The process in accordance with claim 20 wherein the bulky ligand transition metal metallocene~~-type~~ catalyst has electronegativity value in the range of from +0.24 to +0.36 Hartrees.

30. The process in accordance with claim 20 wherein the process is operating for more than 12 hours from start-up of the process.

31. The process in accordance with claim 23 wherein the process is operating for more than 36 hours from start-up of the process.

32. A continuous slurry process for polymerizing ethylene and one or more comonomers having 4 or more carbon atoms in a reactor to produce a polymer product, said process comprising the steps of:

a) introducing ethylene, at least one comonomer, a diluent, and optionally hydrogen into the reactor;

b) introducing the bulky ligand transition metal metallocene~~-type~~ catalyst system into the reactor;

c) withdrawing a slurry comprising a polymer product from the reactor;

d) depressurizing and/or heating the slurry forming a vapor containing the diluent and any unreacted ethylene and comonomer(s);

e) separating the polymer product from the vapor;

f) compressing and distilling the vapor to form a recycle composition comprising isomer(s) of the comonomer(s);

g) reintroducing the recycle composition to the reactor wherein the level of isomer(s) in the recycle composition is maintained at less than 5 weight percent based on the total weight percent of comonomer(s) comonomer and their positional and structural isomers in the recycle composition.

33. The process in accordance with claim 32 wherein the recycle composition, all or a portion thereof, in step (f), is directed to another reactor.

34. The process in accordance with claim 32 wherein prior to step (g) the recycle composition is purged of a portion of isomer(s) having an electronegativity value less than +0.093 Hartrees.

35. The process in accordance with claim 32 wherein the level of the isomer(s) of the comonomer is maintained at less than 3 weight percent based on the total weight percent of the comonomer(s) and its positional and structural isomer(s) in the recycle composition.

36. The process in accordance with claim 32 wherein the level of the isomer(s) of the comonomer is maintained at less than 0.2 weight percent based on the total weight of the comonomer(s) and its positional and structural isomer(s) in the recycle composition.

37. The process in accordance with claim 32 wherein the isomer(s) are internal, di- and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3.

38. The process in accordance with claim 32 wherein the process is operating for more than 6 hours from start-up of the process.

39. The process in accordance with claim 32 wherein one or more of the isomers are selected from the group consisting of cis-3-methyl-pentene-2, trans-3-methyl-pentene-2, cis-hexene-2, trans-hexene-2, 2-methyl-pentene-2, cis-3-methyl-heptene-2, trans-3-methyl-heptene-2, cis-3-methyl-heptene-3, trans-3-methyl-heptene-3, trans-4-methyl-pentene-2, 2-methyl-heptene-2, cis-butene-2, trans-butene-2, 2-methyl-butene-2, 2,3-dimethyl-butene-2, cis-2-methyl-heptene-3, trans-2-methyl-heptene-3, cis-3-methyl-hexene-2, trans-3-methyl-hexene-2, cis-3-methyl-hexene-3, trans-3-methyl-hexene-3, 2-methyl-hexene-2, cis-3-methyl-octene-2, trans-3-methyl-octene-2, cis-3-methyl-octene-3, trans-3-methyl-octene-3, 2-methyl-octene-2, cis-2-methyl-octene-3, trans-2-methyl-octene-3, cis-octene-2, trans-octene-2, cis-3-methyl-nonene-2, trans-3-methyl-nonene-2, cis-3-methyl-nonene-3, trans-3-methyl-nonene-3, 2-methyl-nonene-2, cis-decene-2 and trans-decene-2.

40. The process in accordance with claim 32 wherein the bulky ligand transition metal metallocene~~-type~~ catalyst has an electronegativity value in the range of from +0.24 to +0.36 Hartrees.

41. The process in accordance with claim 32 wherein the process is producing polymer product at a rate greater than 2000 lbs/hr (907 Kg/hr).

42. A process of producing a polyethylene copolymer in the presence of a bulky ligand transition metal metallocene~~-type~~ catalyst system, said copolymer being polymerized from ethylene and at least one alpha-olefin comonomer having 4 or more carbon atoms, the process comprising the steps of:

a) extracting at least a portion of a first isomer of the comonomer whereby the comonomer is at least partially depleted in said first isomer;

b) polymerizing in a reactor the partially depleted comonomer and the ethylene to form a polymer product.

43. The process in accordance with claim 42 wherein the first isomer has an electronegativity value less than +0.093 Hartrees.

44. The process in accordance with claim 42 wherein the isomer(s) are internal, di- and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3.

45. The process in accordance with claim 42 wherein the partially depleted comonomer comprises less than 5 weight percent structural and positional isomers of the comonomer based on the total weight percent of the comonomer entering the reactor.

46. The process in accordance with claim 42 wherein the partially depleted comonomer comprises less than 0.2 weight percent structural and positional isomers of the comonomer based on the total weight percent of the comonomer and its positional and structural isomers entering the reactor.

47. The process in accordance with claim 42 wherein the process is operating for more than 6 hours from start-up of the process.

48. The process in accordance with claim 42 wherein the process is operating for more than 12 hours from start-up of the process.

49. The process in accordance with claim 42 wherein the polymer product has a particle bulk density of greater than 0.3500 g/cc.

50. A process for polymerizing ethylene and at least one comonomer utilizing a bulky ligand transition metal metallocene~~-type~~ catalyst system in a reactor, the at least one comonomer including at least one isomer, the process comprising: a means for preferentially extracting the at least one isomer having an electronegativity less than +0.093 Hartrees.

51. The process in accordance with claim 50 wherein the at least one isomer is an internal, di- and tri- substituted olefin.

52. The process in accordance with claim 50 wherein the at least one comonomer is an alpha-olefin having from 4 to 20 carbon atoms.

53. The process in accordance with claim 52 wherein the at least one isomer of the comonomer has a boiling point in the ranges selected from one of the group consisting of from about 50 °C to about 70 °C, from about -10 °C to about 10 °C and from about 110 °C to about 140 °C.

54. The process in accordance with claim 50 wherein the process further comprises maintaining in the reactor less than 5 weight percent of the at least one isomer of the comonomer based on the total weight percent of the at least one comonomer.

55. A continuous process for polymerizing ethylene and at least one comonomer in the presence of a bulky ligand transition metal metallocene~~-type~~ catalyst compound having an electronegativity value in the range of from about +0.24 to about +0.36 Hartrees, said process operating essentially free of internal, di- and tri- substituted olefins.

56. The process in accordance with claim 55 wherein the internal olefins are isomers of the comonomer.

57. The process in accordance with claim 56 wherein the internal olefins are isomers of the comonomer having an electronegativity value less than +0.093 Hartrees.

58. The process in accordance with claim 55 wherein the process is operating for more than 12 hours from start-up of the process.

59. The process in accordance with claim 55 wherein the process is producing a polymer product having a particle bulk density greater than 0.3500 g/cc.

60. A continuous process for polymerizing an ethylene feed composition and a propylene feed composition introduced to a reactor in the presence of a bulky ligand transition metal metallocene~~-type~~ catalyst system wherein the process comprises the step of removing all or a portion of olefin(s) having an electronegativity value less than +0.093 Hartrees.

61. The process in accordance with claim 60 wherein the olefins(s) are selected from the one of group consisting of 2-methyl-butene-2 and 2-methyl-pentene-2.

62. The process in accordance with claim 60 wherein the level of olefin(s) is maintained at less than 3 weight percent based on the total weight percent of the propylene feed composition.

63. The process in accordance with claim 60 wherein the level of the olefin(s) is less than 0.2 weight percent based on the total weight of the propylene in the propylene feed composition.

64. The process in accordance with claim 60 wherein the process is operating for more than 12 hours from start-up of the process.

65. A continuous process for polymerizing a propylene feed composition introduced to a reactor in the presence of a bulky ligand transition metal metallocene~~-type~~ catalyst system wherein the process comprises the step of removing all or a portion of olefin(s) having an electronegavity value less than +0.093 Hartrees.

66. The process of claim 65 wherein the olefin(s) are selected from one of the group consisting of 2-methyl-pentene-2.

67. The process in accordance with claim 65 wherein the level of the olefin(s) is less than 0.5 weight percent based on the total weight of the propylene in the recycle composition and the process is operating for more than 36 hours from the start-up.

68. The process in accordance with claim 65 wherein the level of the olefin(s) is maintained at less than 0.2 weight percent based on the total weight of the propylene in the propylene feed composition and the process is operating for more than 12 hours from the start-up.

69. The process in accordance with claim 65 wherein the level of the olefin(s) is maintained at less than 0.1 weight percent based on the total weight of the propylene in the propylene feed composition and the process is operating for more than 6 hours from the start-up.

70. A continuous gas phase process for producing a polymer product having a density greater than 0.905 g/cc to about 0.96g/cc , a settled bulk density in the range of from 10 lb/ft^3 (160 kg/m^3) to 40 lb/ft^3 (600 kg/m^3), a particle bulk density greater than 0.3700 g/cc, the process comprising contacting

from about 25 to 90 mole percent ethylene and from about 10 to 75 mole percent of a comonomer having from 4 to 8 carbon atoms in the presence of a bulky ligand transition metal metallocene compound having an electronegativity in the range of from about +0.24 to about +0.36 Hartrees, at a pressure of about 200 psig (1379 kPa) to about 400 psig (kPa), at a temperature in the range from about 30 °C to 110 °C, a partial pressure of ethylene in the range of from 75 psia (517 kPa) to about 300 psia (2069 kPa); and wherein the process is producing polymer product at a rate greater than 500 lbs/hr (227Kg/hr) to about 200,000 lbs/hr (90,900 Kg/hr) while monitoring the level of internal, di- and tri- substituted olefin isomers of the comonomer and maintaining the level of the internal, di- and tri- substituted olefin isomers of the comonomer to less than 0.2 weight percent based on the total weight percent of the comonomer and the olefin isomers of the comonomer present in a recycle stream.

71. The process in accordance with claim 70 wherein the olefin isomers of the comonomer have an electronegativity less than +0.093 Hartrees.

72. The process in accordance with claim 70 wherein the particle bulk density is greater than 0.4000g/cc and the polymer product has a molecular weight distribution from about 2 to about 4.

73. The process in accordance with claim 70 wherein the level of olefin isomers of the comonomer is maintained at less than 0.15 weight percent based on the total weight percent of the comonomer in the recycle stream.

74. The process in accordance with claim 70 wherein the process is operating for more than 12 hours from the start-up prior to removing those olefin isomers of the comonomer having an electronegativity value less than +0.093 Hartrees.

75. A continuous slurry polymerization process for producing a polymer product having a density in the range of from 0.87 g/cc to about 0.96g/cc, a particle bulk density greater than 0.3500 g/cc, the process comprising ethylene and a comonomer having from 4 to 8 carbon atoms in presence of a bulky ligand transition metal metallocene compound having an electronegativity in the range of from about +0.24 to about +0.36 Hartrees, at a pressure of about 400 psig (2758 KPa) to about 800 psig (5516 KPa), at a temperature in the range from about 55 °C to 104 °C, a concentration of ethylene in the range of from about 2 to about 10 weight percent; and wherein the process is producing polymer product at a rate greater than 2000 lbs/hr (907Kg/hr) while after 6 hours from start-up maintaining the level of comonomer isomer(s) selected from the group consisting of internal, di- and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3 to less than 1 weight percent based on the total weight percent of the comonomer present in a recycle composition.

76. The process in accordance with claim 75 wherein the comonomer isomer(s) have an electronegativity less than +0.093 Hartrees and the particle bulk density is greater than 0.3700 g/cc.

77. The process in accordance with claim 75 wherein the level of comonomer isomer(s) are maintained at less than 0.5 weight percent based one the total weight percent of the comonomer in the recycle composition.

78. The process in accordance with claim 75 wherein the process is a loop slurry process.

79. The process in accordance with claim 75 wherein the concentration of ethylene in the reactor is in the range of from 2 to 7 weight percent.

80. The process in accordance with claim 75 wherein the comonomer isomer(s) have boiling points in the ranges selected from one of the group consisting of from about 50 °C to about 70 °C, from about -10 °C to about 10 °C and from about 110 °C to about 140 °C.

81. A process for polymerizing olefins in a reactor comprising a recycle system that enters and exits the reactor, the recycle system comprising a recycle composition, the recycle composition comprising monomer, comonomer, fresh comonomer, optionally hydrogen, and other inert gases, the process comprising the steps of :

(a) withdrawing the recycle composition from the reactor;

(b) removing from the recycle composition a portion of those isomer(s) of the comonomer having an electronegativity value less than +0.093 Hartrees.

82. The process in accordance with claim 81 wherein the isomer(s) removed are selected from one or more of the group consisting of internal, di- and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3.

83. The process in accordance with claim 81 wherein step (b) is carried out after more than 6 hours of operation.

84. The process in accordance with claim 81 wherein the recycle composition comprises less than 3 weight percent isomer(s) of the comonomer based on the total weight percent of the comonomer present in a recycle composition.

85. The process in accordance with claim 81 wherein fresh comonomer is commercial grade hexene-1 comprising greater than 98 % by weight hexene-1.

86. The process in accordance with claim 81 wherein the recycle composition entering the reactor comprises less than 5 weight percent isomers of hexene-1 after a period of more than 12 hours from start-up of the process.

87. The process in accordance with claim 81 wherein the removing step is a distillation process of all or a portion of the recycle composition to remove the isomer(s).

88. The process in accordance with claim 81 wherein the olefins in the recycle composition having a boiling point above about 67 °C are removed.

89. The process in accordance with claim 81 wherein the process is operating for more than 6 hours prior to step (b) in the process.

90. The process in accordance with claim 81 where the monomer is ethylene and the comonomer is an olefin having from 4 to 20 carbon atoms.

91. The process in accordance with claim 81 wherein the monomer and the comonomer have 4 or greater carbon atoms.

92. The process in accordance with claim 81 wherein about 70 % of the isomer(s) are removed in step (b).

93. The process in accordance with claim 81 wherein about 90 % of the isomer(s) are removed in step (b).

94. The process in accordance with claim 81 wherein the process is producing a polymer product having a particle bulk density greater than 0.3500 g/cc.

95. A continuous process for polymerizing olefins in a reactor having a recycle system, the process being carried out in the presence of a bulky ligand transition metal metallocene-~~type~~ catalyst system wherein after a period of more than 6 hours or when the concentration of any or a sum of internal, di- and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3 reaches a level up to about 3 weight percent in a recycle composition in the recycle system, all or portion of the olefins having an electronegativity less than +0.093 Hartrees are extracted from all or a portion of the recycle composition prior to introducing the recycle composition into the reactor.

96. The process in accordance with claim 95 wherein the level of the internal, di- and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3 in the recycle composition is maintained at a level less than 0.2 weight percent.

97. The process in accordance with claim 95 wherein the period of time is more than 12 hours.

98. The process in accordance with claim 95 wherein the olefins are extracted by subjecting all or a portion of the recycle composition to distillation.

99. The process in accordance with claim 95 wherein all or a portion of the recycle system is divided into one or more streams, wherein at least one of the streams is diverted to another recycle system of a second reactor.

100. The process in accordance with claim 95 wherein a portion of the recycle composition entering the reactor is substantially free of the internal, di-

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and tri- substituted olefins excluding cis- and trans- hexene-3 and cis-octene-3.

101. A continuous process for polymerizing olefins in a reactor in the presence of a bulky ligand metallocene-type catalyst system, the process comprises the steps of:

(a) introducing to the reactor a fresh commercial grade comonomer having a level of comonomer olefin(s) excluding ~~the alpha-olefin~~, ethylene and propylene of less than 0.5 weight percent based on the total weight percent of the comonomer; and

(b) maintaining in the reactor an amount of internal, di- and tri- substituted olefin(s) excluding cis- and trans- hexene-3 and cis-octene-3 at less than 0.2 weight percent based on the total weight of the comonomer and comonomer olefin(s) in a recycle composition that enters the reactor.

102. The process in accordance with claim 101 wherein the amount of the internal, di- and tri- substituted olefins is maintained at less than 0.15 weight percent based on the total weight of the comonomer and comonomer olefin(s) in the recycle composition that enters the reactor.

103. The process in accordance with claim 101 wherein the comonomer is introduced to the reactor via the recycle composition.

104. The process in accordance with claim 101 wherein the level of comonomer olefin(s) is less than 0.1 weight percent based on the total weight percent of the comonomer.

105. The process in accordance with claim 101 wherein the alpha-olefin is selected one or more of the group consisting of butene-1, 4-methyl-pentene-1, pentene-1, hexene-1, octene-1 and decene-1.

106. The process in accordance with claim 101 wherein the olefins polymerized in the reactor are selected from one or more of the group consisting of ethylene, propylene, butene-1, 4-methyl-pentene-1, pentene-1, hexene-1, heptene-1, octene-1 and decene-1.

107. The process in accordance with claim 106 wherein the at least one of the olefins polymerized is hexene-1 and the comonomer olefin(s) are selected from one or more of the group consisting of cis-3-methyl-pentene-2, trans-3-methyl-pentene-2, cis-hexene–2, trans-hexene-2 and 2-methyl-pentene-2.

108. The process in accordance with claim 106 wherein the at least one of the olefins polymerized is octene-1 and the comonomer olefin(s) are selected from one or more of the group consisting of cis-3-methyl-heptene-2, trans-3-methyl-heptene-2, cis- 3-methyl-heptene-3, trans- 3-methyl-heptene-3, cis-octene-2 and trans-octene-2.

109. The process in accordance with claim 106 wherein the at least one of the olefins polymerized is 4-methyl-pentene-1 and the comonomer olefin(s) are 2-methyl-pentene-2, and trans-4-methyl-pentene-2.

110. The process in accordance with claim 106 wherein the at least one the olefins polymerized is butene-1 and the comonomer olefin(s) are selected from one or more of the group consisting of cis-butene-2 and trans-butene-2.